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10/590,307

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EXAMINER

FINDLEY, CHRISTOPHER G

ART UNIT

PAPER NUMBER

2482

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DELIVERY MODE

04/27/2011

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |  |  |  |
|------------------------------|--|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/590,307   | <b>Applicant(s)</b><br>FRANCOIS ET AL. |  |
|                              | <b>Examiner</b><br>CHRISTOPHER FINDLEY | <b>Art Unit</b><br>2482                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments filed 2/17/2011 have been fully considered but they are not persuasive.
2. Re claim 9, the Applicant contends that Turaga cannot have a calibration operation for a picture selected because the prerequisite selection operation is missing in Turaga; therefore Turaga does not disclose the feature of at least one reverse calibration operation for pictures selected from the high and low frequency decoded pictures. However, the Examiner respectfully disagrees. As noted by the Applicant, only L frames may contain L regions or A regions. Therefore, the initial selection is between L frames and H frames, with further calibration if the frame selected is an L frame. Support for the Examiner's interpretation is found in paragraph [0040] of Turaga.
3. Re claim 9, the Applicant contends that the scaling taught by Turaga is applied to regions of frames, selectively, but not to pictures; therefore Turaga does not disclose a calibration operation for pictures selected. However, the Examiner respectfully disagrees. Turaga does look at regions in the frames. However, according to paragraph [0040] of Turaga, "During operation, the inverse temporal filtering unit **processes each pair of H and L-frames** included in each GOP..." (emphasis added).
4. Re claim 9, the Applicant also contends that Turaga does not disclose that the number of operations depends on the information in the associated header or flag, and therefore the selection of pictures would not be dependent on an element of information associated with the coded picture. However, the Examiner respectfully disagrees. Only L frames may contain L regions or A regions (Turaga: paragraph [0040]), and the A-region may be placed in the associated header or flag (Turaga: paragraph [0042]). Since processing the A-region requires the extra scaling operation, the Examiner maintains that the selection of the pictures and the number of reverse operations are indeed dependent on an element of information associated with the coded picture in Turaga.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**6. Claims 9, 10, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Turaga et al. (US 20040008785 A1, hereinafter referred to as “Turaga”).**

Re **claim 9**, Turaga discloses a decoding method for a sequence of coded images, the coding realizing an intermediate operation of hierarchical temporal analysis of the motion compensated temporal filtering (MCTF) type providing high frequency and low frequency pictures for their coding, the method comprising: a decoding operation giving high frequency and low frequency decoded pictures, at least one reverse calibration operation for pictures selected from the high and low frequency decoded pictures, the selection of the pictures and the number of reverse operations being dependent on an element of information associated with the coded picture, to provide pictures to synthesize, and a temporal synthesis operation from decoded pictures not selected and said pictures to synthesize (Turaga: Fig. 5 and paragraphs [0037]-[0043]).

Re **claim 10**, Turaga discloses that the information associated with the coded picture is the value of a counter assigned to the picture during the coding (Turaga: paragraph [0037]).

Re **claim 12**, Turaga discloses a decoding circuit to provide high and low frequency decoded pictures and a temporal synthesis circuit of pictures to synthesize, also comprising means to perform a reverse calibration of selected high and/or low frequency decoded pictures to provide pictures to be synthesized, the selection of the pictures and the number of reverse calibrations being dependent on an element of information associated with the picture to decode, and received by the decoder (Turaga: paragraph [0024], the scaling factor is the inverse of the square root of 2).

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Turaga et al. (US 20040008785 A1, hereinafter referred to as "Turaga") in view of Zhang et al. (US 7321625 B2, hereinafter referred to as "Zhang").**

Re **claim 1**, Turaga discloses a method for coding a picture sequence comprising a hierarchical temporal analysis of a group of pictures performing a motion compensated temporal filtering of successive pairs of pictures to supply low temporal frequency pictures and high temporal frequency pictures at different temporal decomposition levels, this analysis realizing, for a given temporal decomposition level and for a pair of low temporal frequency pictures, a motion estimation operation of a current picture B to a previous reference picture A to supply motion vectors then a motion compensated temporal filtering of these pictures to supply a low temporal frequency picture (L) and a high temporal frequency picture (H) at a greater decomposition level, the temporal filtering being replaced by an intra mode coding to obtain at least one low (L) or high (H) frequency picture if the current picture has a level of correlation with a previous picture lower than a threshold the low frequency pictures (L) obtained being thus scaled to be adapted, at the energy level, to the pictures obtained by the motion compensated temporal filtering (Turaga: paragraph [0023], matched L and H-frames are produced), the method comprising, a calibration operation to calibrate the selected pictures by carrying out at least one reverse operation of the scaling operation, for their coding (Turaga: paragraph [0024], the scaling factor is the inverse of the square root of 2).

Turaga does not specifically disclose among the low frequency picture and the final high frequency decomposed pictures obtained at the end of the analysis: a selection operation to select the low (L) or high (H) frequency pictures obtained by intra coding of a picture at a lower decomposition level

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with the additional condition, for the high frequency pictures, that this picture is derived itself from an intra coding. However, Zhang discloses that redundancy in intra coded pictures is exploited in wavelet coding (Zhang: column 6, lines 45-53). Since both Turaga and Zhang relate to wavelet coding, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the intra picture exploitation of Zhang with the scheme of Turaga in order to achieve improved coding efficiency (Zhang: column 6, lines 47-50).

Re **claim 2**, Turaga discloses that the number of reverse operations carried out corresponds to the number of successive intra coding operations of a low frequency picture (L) to arrive at the picture selected if this involves a low frequency selected picture, this number being decreased by one if it involves the high frequency selected picture (L) (Turaga: paragraph [0022], the motion estimation unit 6 will provide a motion vector MV and a frame number for each region matched in the current frame being processed).

Re **claim 3**, Turaga discloses for the calculation of a low L or high H frequency image at a given temporal level, a temporal filtering between the current picture and a following picture of the following pair of pictures of the lower temporal level, if the correlation between the current picture and the previous picture is lower than a threshold and if the correlation between the current picture and this following picture is greater than a threshold the other H or L picture of the given temporal level being obtained by intra coding, this filtering operation being assimilated with the intra coding and not with the temporal filtering for the selection operation (Turaga: paragraph [0028], threshold used to determine matches).

Re **claim 4**, Turaga discloses assigning a picture number to each picture of the group of pictures, and monitoring these numbered pictures during the decomposition by attributing a counter for each number, this counter being updated as follows: the counter is increased each time a low frequency picture (L) is obtained in intra mode, the counter remains unchanged each time a high frequency picture (H) is obtained in intra mode or during a temporal filtering with a following picture, the counter is reset each time a picture is obtained by motion compensated temporal filtering with a previous picture, the reverse operations being carried out according to the value of the counters (Turaga: paragraph [0022], the motion

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estimation unit 6 will provide a motion vector **MV** and a frame number for each region matched in the current frame being processed).

Re **claim 5**, Turaga does not disclose the equations recited. However, Zhang discloses the same equations for H and L (Zhang: equations (9) and (10)). Since both Turaga and Zhang relate to wavelet coding, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the wavelet decomposition of Zhang with the scheme of Turaga in order to achieve improved coding efficiency (Zhang: column 6, lines 47-50).

Re **claim 6**, Turaga does not disclose the equations recited. However, Zhang discloses the same equations for H and L (Zhang: equations (9) and (10) when no motion compensation takes place, as is the case with intra pictures). Since both Turaga and Zhang relate to wavelet coding, one of ordinary skill in the art at the time of the invention would have found it obvious to combine the wavelet decomposition of Zhang with the scheme of Turaga in order to achieve improved coding efficiency (Zhang: column 6, lines 47-50).

Re **claim 7**, Turaga discloses that the calibrated pictures obtained by temporal analysis are then processed by spatial analysis (Turaga: Fig. 5, spatial recomposition 20).

Re **claim 8**, Turaga discloses that the level of correlation is calculated by taking into account the number of connected pixels, that is, connected by a motion vector (Turaga: paragraph [0030]).

Re **claim 11**, Turaga discloses a temporal analysis circuit using the motion compensated temporal filtering and the intra coding, characterized in that the circuit selecting among the low frequency picture and the final high frequency decomposed pictures obtained at the end of analysis, the pictures obtained by an intra coding of a picture at the lower decomposition level, with the additional condition, for the high frequency pictures, that this picture is derived itself from an intra coding, and the circuit carrying out at least one scaling operation for the pictures selected (Turaga: paragraph [0024], scaling is performed).

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### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Contact***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER FINDLEY whose telephone number is 571-270-1199. The examiner can normally be reached on Monday-Friday (8:30 AM-5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Kelley can be reached on 571-272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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